REMARKS

The rejection of the pending claims, as explained below, should be withdrawn. Embodiments of the present invention solve problems associated with projected beam-type smoke detectors that are not all addressed in the prior art of record.

In a normal operating condition, as illustrated in an exemplary embodiment, Fig. 4A of the present application, radiant energy from emitter 12 is projected across the region and is coupled to a receiver 14. In this configuration, the receiver 14 is appropriately aligned along a common axis with emitter 12. An output signal from receiver 14 in a clear air condition can be expected to have a maximum value due to maximum incident radiant energy. However, as illustrated in Fig. 4C, in the event that there is a misalignment between source 12 and receiver and/or sensor 14, an output from sensor or receiver 14 may well be substantially reduced even in clear air. This, in turn, can contribute to false alarms in the presence of relatively minimal amounts of smoke which may not be indicative of an alarm condition.

Systems which embody the present invention can automatically conduct beam alignment tests using a variable filter which is positioned in the path of the beam illustrated in Figs. 1 and 3 of the present application. Test signals can be established, based on the position of the filter in the transmission path, indicative of clear air, as well as various degrees of smoke. The output signals from the receiver or sensor 14 can then be evaluated by the control circuitry to determine if preventative maintenance is necessary. This configuration eliminates a need to have an individual manually conduct tests at the subject detector.

Thus, as is apparent, the beam alignment problems in projected beam detectors directly impact output signals from the receiver or sensor 14 under various obscuration or smoke conditions. On the other hand, the problems may not be apparent in clear air conditions, as, in those circumstances, outputs from the receiver or sensor 14 may still have a sufficient magnitude to mask the misalignment.

Figs. 4C and 4E illustrate two different, exemplary types of mis-alignment problems that the present invention addresses. In Fig. 4C, the source and sensor are displaced and even if initially aligned, Figs, 4A, B, can become misaligned over time. In Fig. 4E, the source/sensor

are fixed relative to one another. However, they can become misaligned relative to a reflector, such as mirror 72.

The rejection of claims 26, 29-32, 38, 42 and 43, as anticipated, by Schwartz et al. is not in keeping with the Patent Office standards for anticipation. We first note, that Schwartz et al. does not in any way address beam misalignments. Source 14, sensor 26 of Schwartz et al. have a fixed, non-varying relationship. Beam misalignments in Schwartz et al., to the extent that such may exist, represent a fixed condition, which has no impact on the operation or performance of the device of Schwartz et al.

The reason that a beam misalignment has no impact on the operation of Schwartz et al. is that Schwartz et al. discloses a method using the light valve 20 or liquid crystal display module 58 to emulate or simulate a coagulation process. As a result, Schwartz et al. receives from sensor 16 a simulated coagulation profile in response to the changing degree of opacity of the light valve 20 or the module 58. As described therein:

> "The computer 24, by virtue of being programmed with a voltage-optical density characteristic for the particular light valve 20, and the speed of response of the light valve 20 to voltage changes can generate any desired time course of change in optical density in order to provide a selected "clot signature" within the possible range of contrast change of the light valve 20." (Col. 4, lines 56-63 Schwartz et al.)

Fig. 6 of Schwartz et al. is a representative simulated clot signature. The simulated clot signature which is to be created by the apparatus of Schwartz et al. corresponds to "standard clot signatures" (Col. 6, line 43) which can be expected to be produced by standardized clotting solutions. Schwartz et al. explains further relative to Fig. 7:

> "As indicated, the upper portion 62 provides a user interface so that information may be conveyed to the operator in the form of alpha-numeric instructions or status information as indicated at region 74a. Once the parameters are entered, the module 58 displays to the operator, the simulated clot signature of Fig. 6 in graphic form as indicated at region 74b for verification of the test to be run. Where the coagulation apparatus provides an output of the calibration run data, the measured data [from a standardized sample] is displayed in the region 74(b) for comparison with the simulated signature. This will give the test operator immediate visual

> feedback of the performance of the coagulation apparatus." (Col. 7, lines 27-39 Schwartz et al.)

As the above makes clear, the simulated clotting signature produced using light valve 20 or graphic LCD module 58 can be visually compared with the output of a standard clotting solution by the operator. This comparison washes out and makes irrelevant pre-existing beam misalignment between source 14 and sensor 16 (which in all likelihood with the structure of Schwartz et al. will be de minimus since the two elements 14, 16 are fixedly carried within unit 12.) Thus Schwartz et al. is directed toward and solves a completely different problem than the apparatus and method of the pending claims. Further, Schwatz et al. has no concern about and does not in any way address beam misalignment issues as claimed.

Anticipation requires that the prior art document being relied on in support of the outstanding rejection contain each of the claimed limitations exactly as set forth in the rejected claim. As noted above, Schwartz et al. does not need to and does not address beam alignment issues.

In support of this rejection, the Examiner stated:

> "the sensor, and the member and <u>inherently</u> including circuits to switch the member from a non-obscuration state to an obscuration state to test beam alignment (see lines 66-69 of column 4)" [pg. 4 Office Action; emphasis ours].

"Inherency in patent law requires that the cited prior art document disclose a device capable of operating <u>only</u> as claimed. Inherency does not embrace probabilities or possibilities. As described above, Schwartz et al. is not attempting to solve a beam alignment problem. Hence, inherency cannot properly be used as a rational in support of the outstanding rejection.

The reference made by the Examiner, pg. 4 Office Action, to Col. 4, lines 66-69 of Schwartz et al. is part of a longer explanation which states as follows:

> "The level of voltage required to produce a given level of opacity in the light valve 20 may vary by as much as 100 mv. Therefore offset and alignment variables which permit calibration of each light valve 20 can be built into the operating program." (Col. 4, lines lines 63-69 Schwartz et al.)

The above makes clear that Schwatz et al. is not discussing beam alignment issues in the noted lines, namely 66-69 of Col. 4, as suggested by the Examiner on page 4 of the Office Action. Further, the Examiner then went on to say:

> "an electrical signal coupled from the sensor to the control circuit is indicative of results of a beam alignment test/calibration of obscuration member (see line 4-line 68 of column. 8)" [Schwartz et al.].

In fact, lines 4-68 of Col. 8 describe the process of Schwartz et al. in producing the simulated clot signature. Nothing in that text relates to testing beam alignment. Rather, that text describes the steps of Schwartz et al. Figs. 9a, 9b, and 9c.

As noted therein relative to the ongoing process:

> "At 88 these parameters are input and displayed in the region 74a and the simulated clot signature is graphed, based on the input parameters, and displayed in the region 74b." (Col. 8, lines 26-30)

Thus, for all of the above reasons, given that Schwartz et al. is not directed to and is not concerned with beam alignment issues, the rejection of the above-noted claims as anticipated by Schwartz et al. should be withdrawn. More particularly, claim 26 includes the following limitation completely missing and not addressed by Schwartz et al.:

> "a control circuit coupled to the source, the sensor, and the member and including circuits to switch the member from a non-obscuration state to an obscuration state to test beam alignment, whereby an electrical signal coupled from the sensor to the control circuit is indicative of results of a beam alignment test." (pending claim 26).

Claim 30 includes the following unmet limitation:

> "automatically changing a transmissive characteristic of a part of the evaluating path thereby altering unscattered beam strength impinging on the sensor to conduct a beam alignment test." (pending claim 30)

Similarly, Claim 42 rewritten in independent form hereby includes the following unmet limitations:

> "where the obscuration member includes a plurality of different test states with each test state associated with a predetermined beam path length between an emitter and a sensor, the control circuit including circuitry for selecting a test state responsive to a determined beam path length." (pending claim 42)

Claim 43 incorporates the following unmet limitations:

> "where the obscuration member includes a beam alignment test state, the control circuit including circuitry to select that state to automatically test beam alignment." (pending claim 43)

Thus, for all the reasons set forth above, Schwartz et al. does not disclose each and every limitation of the subject claims, as claimed, to properly support an anticipation rejection. Withdrawal of the rejection of claims 26, 29-32, 38, 42 and 43 as anticipated by Schwartz et al. is hereby requested.

Graham, relied on to reject claims 26-28, 30-32 as anticipated and unpatentable is not directed to and is not concerned about beam alignment issues. In Graham, temperature compensation is achieved by forming ratios. In this regard, the Examiner is directed to Col. 4, lines 40-67 of Graham. Uses of ratios removes effects of any misalignments between source 14 and sensor 18 of Graham. Whatever those effects may be, the use of ratioing to establish temperature compensation will eliminate such misalignments from Graham's results resulting in them being of no consequence. The Examiner's statement at the top of page 6 of the Office Action relative to Graham, that Graham:

> "comprises a control circuit coupled to the source, the sensor, and the member and including circuits to switch the member from a non-obscuration to an obscuration state to test beam alignment whereby an electrical signal coupled from the sensor to the control circuit is indicative of results of a beam alignment test (see line 50-63 of Col. 1, and lines 60-67 of Col. 3, Graham)

is technically inaccurate. None of the text of lines 50-63 of Col. 1 of Graham addresses beam alignment problems or beam alignment tests. In fact, that text pertains to conventional usage of chopped dual beam filters for calibration purposes. Similarly, lines 50-67 of Col. 3 of Graham merely described operational characteristics of Graham's apparatus and do not in any way address beam alignment or testing beam alignment.

At least the same limitations noted above relative to claims 26 and 30 are unmet by Graham. For the above reasons, Graham does not anticipate any of claims 26-28, 30-32. Hence, the anticipation rejection thereof in view of Graham should be withdrawn.

The obviousness rejection of claims 33-35 and 37 as unpatentable over Schwartz et al. in view of Taylor et al., is defective for at least the reasons set forth above. In that rejection, the Examiner restated the previous technically incorrect assertion, namely:

> "a control circuit [24/50] coupled to the source, the sensor, and the member and inherently including circuits to switch the member from a non-obscuration state to an obscuration state to test the beam alignment (see lines 66-69 of column 4), whereby an electrical signal coupled from the sensor to the control circuit is indicative of results of a beam alignment test/ calibration of obscuration member (see line 4 through line 68 of column 8)." (Page 7 Office Action).

As noted above, "inherency" in patent law, requires that the disclosed structure unequivocally function or operate in only one way in accordance with the rejected claim. Such is not the case with Schwartz et al. especially in view of the facts as described above.

Schwartz et al does not test beam alignment or even address beam alignment issues. Taylor et al. is also completely silent relative to beam alignment issues. Neither Schwartz et al. nor Taylor et al. provide the necessary suggestion, motivation or teaching, given their complete silence relative to beam alignment problems and beam alignment testing, to properly combine Schwartz et al. in view of Taylor et al. so as to make any of claims 33-35 and 37 obvious. Both Schwartz et al. and Taylor et al. are directed to completely different types of structures and solutions to different problems than as claimed.

Similar comments apply to the defective obviousness rejection of claims 33 and 36 as unpatentable over Graham in view of Taylor et al. As noted above, Graham does not discuss or

address beam alignment or beam alignment issues. Ratioing as taught by Graham eliminates any beam misalignment effects from Graham's results. The Examimer, as discussed above, can not properly rely on "inherency" with respect to Graham's disclosure. Taylor et al is completely silent as to beam alignment problems or beam alignment issues.

Graham would have no need to "perform operational tests in several different path lengths" as argued by the Examine, pg. 9 Office Action, in rejecting claims 33 and 36. The only motivation for such a conclusion comes from having an understanding of the present application and the pending claims. Nothing about either Graham or Taylor et al., alone or in combination, suggests modifying Graham so as to switch a controllable obsuration member "from a non-obscuration state to a selected obscuration state, selected based on path length, whereby an electrical signal coupled from the sensor to the control circuit, is indicative of a test of sensed beam strength." (claim 33 and 36).

Instead, the reasoning used to reject claims 33 and 36 is clearly based on an improper hindsight reconstruction given the complete silence of both Graham and Taylor et al. as to the limitation from claims 33 and 36 quoted above. Thus, for at least the above reasons, the pending claims are allowable over the cited prior art.

Relative to the objections raised by the Examiner in numbered Section 1 of the Office Action, page 2 thereof, various of the calims have been amended to obviate those objections.

Claims 26-29, 30-32 and 43 were rejected pursuant to 35 U.S.C. §112, second paragraph, numbered Section 3 of Office Action, to the certain alleged indefinitenesses. Relative to claim 26, it is submitted that the claim need not "define an axis or reference to which the beam will be aligned in said beam alignment test" to comply with the requirements of the patent statute. The claims are to be read by those of skill in the art who are familiar with the disclosure and figures of the subject patent.

Figs. 4A-4E illustrate and the relevant portion of the specification, for example, page 4, lines 4-24 as well as page 7, lines 19-page 8, line 9, describe exemplary embodiments of the beam alignment tests in accordance with the invention. Figs. 5A and 5B describe a methodology

of doing same in extensive detail. Thus, it is submitted that one of ordinary skill in the art would understand the meaning of "to test beam alignment" and "indicative of results of a beam alignment test" of claim 26. It is simply unnecessary to include a further limitation which defines an axis or reference to which the beam will be aligned, as asserted by the Examiner in the Office Action. Similar comments apply to the rejection of claims 27-32 as well as 43.

The rejection of claims 33-37 pursuant to 35 U.S.C. §112, first paragraph, numbered Section 5 Office Action, should also be withdrawn in that the claims do comply with the written description requirement. The Examiner's attention is directed to page 2 of the specification, lines 23-26 thereof, where in it is stated:

> "If the filter uses a graduated obscuration, then the test position may be varied to a predetermined obscuration position on the filter. In that way, the test can be adjusted to account for the distances of the projected beam in the detection system."

That text provides the required support for claims 33-37, particularly the limitation which states:

> "a control circuit coupled to the source, the sensor, and the member and including circuits to switch the member from a non-obscuration state to a selected obscuration state, selected based on path length, where by an electrical signal coupled from the sensor to the control circuit is indicative of a test of sensed beam strength." (claims 33-37)

Thus, for all the above reasons, it is submitted that the pending claims are allowable. Allowance of the application is hereby respectfully requested.

Respectfully submitted,

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